COLUMBIA-WRIGHTSVILLE BRIDGE
(Lincoln Highway, Bridge over Susquehanna River)
(Lancaster-York Intercounty Bridge)
Pennsylvania Historic Bridges Recording Project
Spanning Susquehanna River at Lincoln Hwy. (State Rt. 462)
Columbia
Lancaster County
Pennsylvania

HAER No. PA-473

PHOTOGRAPHS

XEROGRAPHIC COPIES OF COLOR TRANSPARENCIES

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
1849 C Street, NW
Washington, DC 20240

HAER PA 36-Col, 1-

HISTORIC AMERICAN ENGINEERING RECORD

COLUMBIA-WRIGHTSVILLE BRIDGE
(Lincoln Highway, Bridge over Susquehanna River)
(Lancaster-York Intercounty Bridge)

HAER No. PA-473

Location:	Spanning Susquehanna River at Lincoln Highway (State Route 462), between Columbia, Lancaster County, Pennsylvania, and Wrightsville, York County, Pennsylvania.
USGS Quadrangle:	Columbia West, Pennsylvania (1964, photorevised 1972).
UTM Coordinates:	18/371044/4432022
Date of Construction:	1929-30.
Designer:	James B. Long, consulting engineer.
Builder:	Wiley-Maxon Construction Company (Dayton, Ohio), contractors.
Present Owner:	Pennsylvania Department of Transportation.
Present Use:	Vehicular bridge.
Significance:	When it was dedicated on Armistice Day, 1930, the Columbia-Wrightsville Bridge was the longest multiple-arch concrete bridge in the world. Twenty-eight three-ribbed open-spandrel reinforced concrete arches, each spanning 185'-0", carry the bridge across the Susquehanna between Lancaster and York counties. Another twenty spans make up the bridge's 6657'-0" total length. The span's construction was innovative because it involved the cooperative effort of two counties. Four bridges preceded this span at this historically important river crossing. The Columbia-Wrightsville Bridge was designated a National Historie Civil Engineering Landmark in 1984, and was listed in the National Register of Historic Places in 1988.
Historian:	Blythe Semmer, August 1997.

Project Information: This bridge was documented by the Historic American Engineering Record (HAER) as part of the Pennsylvania Historic Bridges Recording Project - I, co-sponsored by the Pennsylvania Department of Transportation (PennDOT) and the Pennsylvania Historical and Museum Commission during the summer of 1997. The project was supervised by Eric DeLony, Chief of HAER.

CHRONOLOGY

3 November 1925	Voters in Lancaster and York Counties pass referenda for $1.5 million indebtedness in each county for the construction of an intercounty toll bridge.
April 1926	Lancaster and York county commissioners submit petitions to their respective Courts of Quarter Sessions asking for approval of the joint effort to construct a bridge and share the expense.
January 1929	A Joint Board of Toll Bridge Commissioners is chosen by the two counties.
18 February 1929	Commissioners approve plans and specifications prepared by James B. Long, consulting engineer.
9 April 1929	Closing date for bids.
9 May 1929	Wiley-Maxon Construction Company of Dayton, Ohio, signs contract.
12 June 1929	First concrete is poured.
28 September 1930	Contractors complete bridge 140 days ahead of schedule.
30 September 1930	New bridge opens at 12:12 a.m.; Pennsylvania Railroad bridge is closed to vehicular traffic at the same moment.
11 November 1930	Dedication ceremony.
31 January 1943	Toll is removed as bridge pays for itself.

The Columbia-Wrightsville Bridge is an outstanding example of innovation in bridge engineering. It demonstrates that concrete can be economical and aesthetically pleasing while showing that the material is well suited to the challenges of an unusually wide crossing. The span between Columbia and Wrightsville carried the Lincoln Highway, which was traveled by increasing numbers of motorists in the 1920s. The construction of the Columbia-Wrightsville Bridge was a cooperative effort between Lancaster and York counties, an innovation in itself, to relieve traffic jams caused by the previous bridge. The Wiley-Maxon Construction Company made the most of the site's advantages and used creative means to adapt to the extreme length of the bridge, approximately 1.26 miles. The span continued to carry the bulk of traffic between Lancaster and York counties until a wider concrete girder bridge was constructed upstream along the U.S. 30 bypass in 1971. The Columbia-Wrightsville Bridge was designated a National Historic Civil Engineering Landmark on 16 October 1984. Today it continues to serve traffic on State Route 462.

Description

The Columbia-Wrightsville Bridge was the longest multiple-span concrete arch highway bridge in the world when it was completed in 1930. It may still be the longest of its kind. Forty-eight spans make up the bridge's 6657'-0" total length. This bridge spans not only the Susquehanna River, but also Conrail railroad tracks, Front Street on the Lancaster County shore, and Front and Howard streets in Wrightsville on the York County shore. Twenty-eight open-spandrel ribbed reinforced concrete arches spanning the river have the maximum clear span length of 185'-0". The arches consist of three concrete ribs, each 7'-0" wide. The ribs are tied together at five points in the arch by horizontal concrete struts. Twenty other spans on the ends of the bridge, forming the approaches, vary in length. Advancing from the Lancaster shore, spans No. 1 through 8 are supported by reinforced concrete beams, each 48'-0" long. Span No. 9 rests on steel plate girders 75'-0" long, followed by five reinforced concrete beam spans each 46'-0" long. On the opposite side of the twenty-eight river spans, span No. 43, a steel plate girder span, measures 80'-0", and five reinforced concrete beam spans are each 46'-0" long. The steel plate girder spans are now encased in gunite. The clear roadway width is 38'-0", now surfaced with latex concrete. There is one 6'-0" sidewalk on the downstream side, for a total deck width of 48'-0". Concrete brackets project from the spandrel walls to mark the locations of transverse deck beams. The walkway is defined by a 12"-wide closed parapet railing which is incised. Large stepped pylons on top of each pier originally supported light standards. The steps on either side of the light standard pedestals are decorated with a Greek key design. The original lights have been removed and replaced with modern fixtures. Twelve conduits for utility lines are built into the pedestrian walk on the bridge. One conduit is located in each parapet wall for the bridge lighting.[1]

---

[1] Bridge inspection file, BMS No. 36-0462-0010-0000 (PennDOT District 8-0, Harrisburg, Pennsylvania).

The Columbia-Wrightsville Bridge was rehabilitated by PennDOT during 1987 and 1988. During this project the asphalt roadway surface was removed and replaced with concrete. Transverse concrete beams were rebuilt at deck joints on five of the arch spans, and the drainage system was cleaned and updated throughout the bridge. Other repairs included the replacement of the abutment backwalls and the repair of structural cracks. Spalled concrete that had exposed reinforcing bars was cleaned and repaired as well. Other repairs included restoring decorative elements and general refurbishment.[2] The bridge also underwent rehabilitation and repairs in 1964, which were contracted to McMinn Industries. McMinn was also the contractor responsible for the application of a hituminous wearing surface in 1945.

Reinforced Concrete Technology

Reinforced concrete arch bridges were developed at the end of the nineteenth century by French and Swiss engineers. The first was built in the U.S. in 1889. The system of reinforcing arch ribs with I-beams or trusses, developed by Viennese engineer Joseph Melan, led to greater popularity of reinforced concrete arch bridges. He was granted an American patent for his work in 1894.[3] Though American engineers experimented with the possibilities of the reinforced concrete arch, fixed arches with massive ribs, like the Columbia-Wrightsville Bridge, or barrels have remained the most common types.[4]

Planning for an Intercounty Bridge

The Columbia-Wrightsville Bridge occupies the site of an important traditional Susquehanna River crossing, a gateway to the western expansion of Pennsylvania. The construction process for this bridge is worthy of its illustrious history. It involved both innovative construction methods and cooperation between two counties in a project unlike any undertaken before. The Columbia-Wrightsville Bridge required creative action on the part of its engineer, contractors, and Board of Commissioners, as well as an act of Congress.

The movement to construct a free public bridge across the Susquehanna between Columbia and Wrightsville began in 1920 with the Lancaster Automobile Club, the Auto Club of York, and the Chambers of Commerce of the two counties. Need for a vehicular bridge was dire, as the existing crossing over the Pennsylvania Railroad bridge backed up automobile traffic along the Lincoln Highway. As the automobile age gained momentum during the 1920s, congestion at the Columbia-Wrightsville Bridge became intolerable when cars were forced to

---

[2] Pennsylvania Department of Transportation, "Environmental Evaluation Report, Columbia-Wrightsville Bridge, L.R. 128, Section B14, York and Lancaster Counties, Pennsylvania" (Pennsylvania Department of Transportation, Engineering District 8-0, Harrisburg, Pennsylvania).

[3] Carl W. Condit, *American Building Art: The Nineteenth Century* (New York: Oxford University Press, 1960), 248-49.

[4] Condit, *American Building Art: The Twentieth Century* (New York: Oxford University Press, 1960), 195.

wait while Pennsylvania Railroad trains crossed over the bridge. The steel truss bridge could carry two lanes of vehicular traffic (although one lane had to be stopped to allow an over-width vehicle to pass) or one train, but not both. The Lincoln Highway, meanwhile, was the nation's first coast-to-coast highway route, and it crossed the entire state of Pennsylvania. Tension between the needs of the railroad company, which owned the bridge, and motorists led to the idea for a new, separate vehicular bridge with room for pedestrians.[5] These organizations formed committees to explore the possibility of jointly constructing a toll bridge at the Susquehanna River crossing. However, the committees soon discovered that they had no legal power to construct a bridge cooperatively. The beginnings of the Columbia-Wrightsville bridge must therefore be read in the legislation and court cases that made this action by Lancaster and York counties legal.

The beginning of the legislative process was the passage of an act of the Pennsylvania General Assembly on 28 June 1923 (P.L. 875), which stated that counties could issue bonds to finance the construction of bridges when a tax levy would overburden the county's taxpayers. The act also permitted the collection of tolls, with the Highway Department's approval, on joint county bridges costing more than $400,000.00, to pay for their construction. Tolls would be discontinued once the construction debt was paid off. This act was amended on 13 May 1925 (P.L. 667), which further delineated the process of constructing intercounty bridges and provided for the assessment of and payment for lands taken in the building process. A referendum secured the support of the citizenry on 3 November 1925, when voters in Lancaster and York counties voiced overwhelming support for the project at the polls.[6] Voters approved a $1.5 million bond issue in each county to support the new bridge's construction. Financing, maintenance, and responsibility for the construction of the new structure would be shared equally by the two counties.

The approval of the U.S. Congress was secured before the project advanced. York County commissioners realized that a special bill was required before the project could move forward, and in May 1924 they requested Samuel F. Gladfelter, U.S. Representative from the Twenty-second District of Pennsylvania, to present a bill giving Lancaster and York counties the right to construct an intercounty bridge.[7] U.S. Representative W. W. Greist of Lancaster County ultimately sponsored the legislation that was passed on 7 May 1926. The act of Congress stipulated that construction of the new bridge had to begin within one year of the passage of the legislation and that the entire project must be completed within three years. Additionally, the tolls needed to be sufficient to provide for a sinking fund that would pay for the bridge's construction and the interest due on the bonds used to finance it within thirty years of

---

[5] Robert S. Mayo, "The Fifth Columbia-Wrightsville Bridge," *Journal of the Lancaster County Historical Society* 73 (1969): 26.

[6] *Lancaster New Era* (10 November 1930).

[7] York County, Pennsylvania, *County Commissioners' Minutes* (York County Courthouse, York, Pennsylvania), 12 May 1924.

completion.[8] Lancaster and York counties finally had their approval and a mandate to proceed with the bridge. The next step was the approval of the project by the Court of Quarter Sessions in each county. The courts granted their approval just before the passage of the legislation: on 21 April 1926 in York County, and on 24 April 1926 in Lancaster County.[9]

Financing the bridge was the next hurdle in the planning process. The bridge would be a toll bridge, paid for equally by the two counties through bonds. The tolls would then allow the bridge to pay for itself and in a matter of years become a free highway bridge. The commissioners of each county then presented their Courts of Quarter Sessions with a proposal to use the tolls to finance a sinking fund that would pay interest on the bonds and contribute to their redemption. These twin proposals were approved in the Lancaster County court on 22 May 1926, and in York on 20 September 1926.[10]

Following the legislative approval of Congress and the financial approval of the Courts of Quarter Sessions, taxpayers' suits were filed in each county contesting the constitutionality of the Pennsylvania General Assembly legislation enabling the project, and the authority of the Lancaster and York county commissioners to cooperatively construct a toll bridge.[11] The case in York County went to the Pennsylvania Supreme Court. The indebtedness authorized by the vote of 3 November 1925 would have exceeded two percent of the county's assessed valuation, which was the existing limit for county debt. Therefore the taxpayer vote expressed approval for the project and for the debt increase in York County. The legality of raising the permissible debt for York County was debated in this case. Irvin I. Ruler, Sr., the appellant, also voiced concern that since the low water mark of the York County shore was the boundary between the two counties, the project did not fall on the line or over a river on the line between two counties. That terminology had been used in the acts of 28 June 1923 and 13 May 1925.[12]

The opinion by Justice Schaffer of the Pennsylvania Supreme Court stated that because residents of the two counties would share the advantages of the bridge equally, the boundary line debate was unnecessary. The higher court also upheld the lower court's decision to approve the bond issue and voiced the opinion that the project was entirely constitutional. In his opinion, Justice Schaffer noted that "this is not only one of the most important river crossings within the

---

[8] "An Act Granting the consent on Congress to the counties of Lancaster and York, in the State of Pennsylvania, to jointly construct a bridge across the Susquehanna River between the borough of Wrightsville, in York County, Pennsylvania, and the borough of Columbia, in Lancaster County, Pennsylvania," *U.S. Statutes at Large* (1926).

[9] George S. Wolf, *Dedication Program and History: Lancaster-York Intercounty Bridge, Armistice Day 1930* (Lancaster: Conestoga Publishing Co., 1930), 35 (Wrightsville-Columbia bridges file, Historical Society of York County, York, Pennsylvania).

[10] Wolf, *Dedication Program*, 35.

[11] Wolf, *Dedication Program*, 35.

[12] *Ruler* v. *York County, Pennsylvania Supreme Court Reporter* 290: 431.

bounds of the Commonwealth but of the Nation. It is manifest from the enormous traffic which naturally flows to this point that a new bridge there is a matter of importance."[13]

The commissioners of Lancaster and York counties went ahead with financing the Columbia-Wrightsville Bridge construction through a bond issue. On 16 January 1930, the York County commissioners resolved the schedule for the maturity of the bonds, which were to be issued 1 February 1930, at an annual interest rate of 4-1/2 percent. The bonds were issued in denominations of $1000.00 each, and 1,400 were released by the county on February 1. The county accepted sealed bids for the bonds until 3 February 1930.[14]

New county commissioners took office in January 1928, and later that year a Joint Board of Toll Bridge Commissioners was formed to facilitate work on the Lancaster-York Intercounty Bridge, as it was called by the Commission. The Joint Board chose G. Graybill Dichm of Lancaster County as their president. At about the same time, U.S. Representative Greist proposed another act of Congress extending the project completion date from 7 May 1929 to 16 February 1931. The legislation took effect on 16 February 1928. On 10 August 1928, the date the Joint Board was officially formed, James B. Long of Norristown, Pennsylvania, was chosen as the engineer for the project. He was instructed to prepare plans and specifications for the bridge, which he presented on 8 November 1929. That day, the Commissioners approved plans for a concrete bridge, although Long had prepared plans for both concrete and steel bridges. His final plans were ready on 18 February 1929, and were approved by the Board. They then moved to advertise for construction proposals on 9 March 1929, and accepted bids until 9 April 1929. On the day the bids were opened, 174 people attended the meeting of the Lancaster County commissioners, which had to be moved to a court room because of the size of the crowd.[15] Thirteen bids were received for the project. Proposals from the Phoenix Bridge Company and the McClintic-Marshall Company, for steel bridges of each company's own design, were rejected for not following the plans and specifications stipulated by the two boards. Construction companies from across Pennsylvania as well as Baltimore, Boston, and Chicago bid on the project, which was ultimately awarded to Wiley-Maxon Construction Company of Dayton, Ohio, by unanimous vote on 26 April 1929. Theirs was the low bid at $2,484,000.00.[16]

Wiley-Maxon Construction Company had been recently formed by two men with considerable experience in the construction field. Glen Wiley and G. W. Maxon were the partners in the firm. Wiley is known for his invention of the "Wiley Whirley," which was a

---

[13] *Ruler* v. *York County,* 431.

[14] York County, *County Commissioners' Minutes,* 16 January 1930.

[15] Lancaster County, Pennsylvania, *County Commissioners' Minutes* (Lancaster County Courthouse, Lancaster, Pennsylvania), 9 April 1929.

[16] Lancaster County, *County Commissioners' Minutes,* 9 April 1929; Wolf, *Dedication Program,* 36.

steam crane with an unusually long boom. Maxon was a former U.S. Army Corps of Engineers civil engineer.[17]

In their contract with Wiley-Maxon, the members of the Joint Board of Commissioners offered a $400.00 bonus for each day the project was finished ahead of schedule. The contractors would be assessed an equal penalty per day if the project ran over schedule. This measure was an incentive for the contractor to work faster, but an early finish to the bridge construction would also reduce the amount of interest that would have to be awarded to the bonds issued to finance the project. In the same vein, every day sooner the bridge opened was one more during which the Lancaster-York Intercounty Bridge Commission could collect tolls to retire the construction cost of the structure.[18] The bridge was finished 140 days ahead of schedule, on 29 September 1930.

The impending completion of the new bridge brought into question the continued use of the Pennsylvania Railroad bridge that had served railroad trains as well as vehicles at the crossing since 1897. The Pennsylvania Railroad Company applied to the Public Service Commission for permission to cease public use of its bridge and convert it to railroad purposes only. On 29 September 1930, the Public Service Commission approved the Pennsylvania Railroad's request and instructed it to close the old bridge to vehicular traffic when the new bridge was completed. On 30 September 1930, the official transfer of vehicular traffic took place when the new bridge opened at 12:12 a.m.[19]

Construction of the Columbia-Wrightsville Bridge

The design and construction methods used in the building of the Columbia-Wrightsville Bridge were as innovative as the cooperative means used to direct and finance its construction. The bridge was the subject of an article in *Construction Methods,* a trade journal, describing the massive steel arch centers that were used to form its many arches.

The first step in construction was the erection of a temporary wooden trestle out from each bank of the river. The trestle was used to transport materials and workmen as the concrete piers were poured during the first season of construction. The other alternatives for providing a working surface for the crews, a cable-way or a floating plant, were ruled out because of the immense width of the Susquehanna at this point (over a mile) and the demands of constructing tall arches, among other considerations.[20] The 5,600'-long construction trestle included three sets of rail tracks. Two were narrow 36"-gauge tracks for industrial locomotives that would transport materials such as concrete from the mixing plants on either side of the river to the work site at a

---

[17] Mayo, "The Fifth Columbia-Wrightsville Bridge," 28.

[18] Mayo, "The Fifth Columbia-Wrightsville Bridge," 31; Wolf, *Dedication Program,* 36.

[19] Wolf, *Dedication Program,* 37.

[20] "Huge Steel Arch Centers," 55.

speed of 18 miles per hour. The other set of tracks was an 18'-0" wide-gauge track for the six steam-powered Wiley Whirley cranes. They had an unusually long 85'-0" boom and were used to construct the trestle, build cofferdams for pier construction, position steel arch centers, and place concrete for the arch ribs.[21] These six gantry cranes were raised up 12'-0" and straddled the narrow-gauge tracks so that the industrial locomotives could move unimpeded underneath them. This efficient use of space meant that the construction trestle could be narrower — but even then it required one million board feet of lumber to construct.[22]

The construction crews began work on both banks of the river in June 1929. The first task was to construct the piers, which was completed by 14 September 1929, during the first construction season.[23] Cofferdams were filled with puddled clay, and the water inside was pumped out to permit the pouring of the concrete piers. The Susquehanna's shallow waters made this process easier, as the piers could be anchored in the bedrock that lay just a few feet under the river's surface.[24]

Once the piers were completed, steel arch centers were moved in to form the reinforced concrete arch ribs. The arch centers were manufactured by the Blaw-Knox Company of Pittsburgh, and the first was erected on wooden towers on 13 August 1929.[25] Robert Mayo, a Lancaster resident, was the field engineer for the Blaw-Knox Company. He has described the innovative process by which the huge forms were used and re-used:

> Five sets of centers were erected on each side of the river under the north rib, and after the concrete had been poured and obtained sufficient strength, (7 days) they were slid sideways 16 feet and spotted to catch the second rib of that span. After supporting the third rib they were loaded onto a flat car and towed five spans ahead.[26]

The repeated use of these arch centers was one way that the Wiley-Maxon Company aggressively dealt with the demands of constructing a very long bridge quickly.

The materials list for the construction of the Columbia-Wrightsville bridge is gargantuan: 101,000 cubic yards of concrete, 7,991,000 pounds of reinforcing steel, and 5,000,000 board feet of lumber were used to build a bridge that weighs 425,000,000 pounds.[27] Suppliers to the

---

[21] "Huge Steel Arch Centers," 57-58.

[22] Mayo, "The Fifth Columbia-Wrightsville Bridge," 29.

[23] "Huge Steel Arch Centers," 58.

[24] Mayo, "The Fifth Columbia-Wrightsville Bridge," 30.

[25] Wolf, *Dedication Program,* 45.

[26] Mayo, "The Fifth Columbia-Wrightsville Bridge," 30.

[27] Wolf, *Dedication Program,* 45.

construction project advertised proudly in the local newspapers the day the bridge was dedicated. The Federal Steel Foundry Company provided steel castings; Hastings Pavement Company, asphalt blocks used in paving the bridge; and E. T. Edwards of Columbia, the steel reinforcing bars. Even the J. E. Baker Company of York, supplier of crushed stone, and the J. C. Budding Company of Lancaster, supplier of sand, announced their role in the creation of the remarkable new bridge.

The construction of the bridge was really two jobs rather than one. The contractor assembled identical plants on either side of the river. Each had its own superintendent, foremen, equipment, sawmill, blacksmith shop, concrete mixing plant, and other services.[28] During pier construction, the two teams carried on their work twenty-four hours a day, as two 11.5-hour shifts worked both night and day. Maxon described this part of the project as "two competing jobs a mile apart and separated by a river."[29] The fast pace of construction insured that the piers and eighteen out of twenty-eight arches could be completed before the end of the first construction season. This allowed the contractors to remove the wooden trestle before the punishing ice on the Susquehanna in the winter harmed it. After the piers and the first round of arches were completed, the arch centers could be moved along the completed parts of the span, thereby making the construction trestle unnecessary in the second construction season.[30]

The Columbia-Wrightsville Crossing

The Susquehanna River crossing between Columbia and Wrightsville has historically been one of the most important river crossings in Pennsylvania. This location, which was traversed via ferry before the construction of the first wooden bridge in 1814, was an important gateway for western expansion. John Wright received a charter from the colonial government to operate a ferry at the site in 1733, which had previously been a crossing spot for Native Americans. The town that bore his name, Wright's Ferry, would later become Columbia. Wright contributed to the traffic at the ferry by constructing a road on the east bank of the river that connected to a post road between Lancaster and Philadelphia. Wright's son, John Wright, Jr., built a road on the west bank five years later, connecting the ferry crossing with roads leading to York and into Maryland.[31] This network of roads crossing the Susquehanna at Columbia and

---

[28] Wolf, *Dedication Program,* 41.

[29] "Huge Steel Arch Centers," 56.

[30] "Huge Steel Arch Centers," 56.

[31] "First Span, Replacing Wright's Ferry, Was Razed By Ice Gorge," *Lancaster New Era* (Columbia-Wrightsville Bridge Edition, 10 November 1930): 1-2.

Wrightsville formed part of the system that would become the Lincoln Highway in 1913, the first coast-to-coast automobile route.[32]

The first wooden bridge was built in 1814, when the increase in ferry traffic demanded a permanent crossing. The Pennsylvania General Assembly authorized construction of this bridge in an act passed on 2 April 1811. The crossing was to be operated by a private company, the Columbia Bridge Company, as a toll bridge. They hired Theodore Burr, a Connecticut bridge builder who had moved to Pennsylvania in 1811, to construct a wooden bridge at the crossing.[33] It was made up of twenty-seven spans. This first bridge lasted until 1832, when it was destroyed by an ice gorge. The second wooden bridge achieved notoriety during the days preceding the battle of Gettysburg. On 28 June 1863, Confederate troops were marching north under the command of General John B. Gordon in an effort to capture Philadelphia when they reached the Wrightsville shore. Union forces on the Columbia shore first tried to blow up the bridge. When that effort failed, they set the entire structure on fire to prevent the Confederates from crossing the Susquehanna. The immense width of the river at this point made the crossing too wide to ford. The Confederates turned back south toward Gettysburg after having helped extinguish the flames.[34]

The third bridge was opened on 4 January 1869. This wooden Howe truss had twenty-nine spans and covered a distance of 5390'-0". Later, two iron spans were inserted in the middle of the bridge as precaution against damage of the entire bridge by fire. The third bridge ushered in the era of railroad travel at the crossing. It was partially opened to railroad use on 1 March 1869. One year later, on 28 June 1870, the Penn Central Railroad began railroad service from Philadelphia to York over the third bridge. This improved service was made possible by the fact that the Penn Central had acquired the Wrightsville Branch Railroad and could now offer through service rather than stopping trains at Columbia.[35] On 1 July 1879, the Columbia Bridge Company sold the span to the Pennsylvania Railroad.[36] From this moment until the construction

---

[32] Brian A. Butko, *Pennsylvania Traveler's Guide: The Lincoln Highway* (Mechanicsburg, Pennsylvania: Stackpole Books, 1996), xix. See the introduction to this volume for a general description of the development of east-west roads in Pennsylvania.

[33] Burr built five of the country's greatest wooden bridges at crossings of the Susquehanna. Four of these were in Pennsylvania, and they included the spans at Nescopeck Falls, Harrisburg, and McCall's Ferry in addition to the Columbia bridge. Burr's wooden arch design, which he patented in 1817, would become the most commonly constructed wooden bridge type. Philip S. Klein and Ari Hoogenboom, *A History of Pennsylvania,* 2nd edition (University Park: Pennsylvania State University Press, 1980), 205, 575; and Donald C. Jackson, *Great American Bridges and Dams* (New York: John Wiley and Sons, 1988), 23.

[34] "First Span, Replacing Wright's Ferry, Was Razed By Ice Gorge," 1-2.

[35] Wrightsville-Columbia bridges file, York County Historical Society; Robert H. Goodell, "The Second Columbia-Wrightsville Bridge," *Papers of the Lancaster County Historical Society* 57 (1953), 15.

[36] Wolf, *Dedication Program,* 33.

of the present Columbia-Wrightsville bridge in 1929-30, rail traffic would have a profound influence on the Columbia-Wrightsville bridges.

The third bridge was destroyed by a wind storm in September 1896. The Pennsylvania Railroad quickly reconstructed it in a period of twenty-one days in 1897. The brief construction period of the fourth bridge indicates its importance to the Pennsylvania Railroad system. On 22 January 1897, the railroad awarded a construction contract for the new steel bridge designed by William H. Brown, Chief Engineer of the Pennsylvania Railroad Company, to the Edgemoor Bridge Works of Wilmington, Delaware.[37] The company immediately began work on a 2522'-3" steel bridge of thirteen spans on the Columbia shore. Across the river, A. P. Roberts of Philadelphia was contracted to build the bridge out from the Wrightsville shore, a total of fourteen spans.[38] Wiley-Maxon would later use the same method of two separate construction sites to speed the process of bridging this immense crossing.

Designers of the fourth bridge provided for two decks, where vehicles and pedestrians would cross on the upper level and trains on the lower level. The upper level was never floored for pedestrian and vehicle traffic, however, and when the bridge opened it had one deck for the use of both trains and vehicular traffic.[39] This arrangement became the source of the traffic jams along the Lincoln Highway that frustrated Lancaster and York county residents into developing plans for a new bridge exclusively for vehicles and pedestrians.

The fourth bridge remained in use by the Pennsylvania Railroad until 1958, when it was dismantled. The piers remain in the Susquehanna just north of the present Columbia-Wrightsville Bridge, however, and act as icebreakers protecting the concrete bridge downstream. They also serve as a reminder of the other spans that stood at this crossing. The Columbia-Wrightsville crossing has witnessed the full evolution of transportation along the Susquehanna, from ferry crossing to national highway.

The Columbia-Wrightsville Bridge is a landmark in American engineering because it stretched the capacity of the reinforced concrete arch bridge as well as the construction process. The mammoth crossing of the Susquehanna at this site demanded that bridge engineer James B. Long consider what type of bridge would best serve so long a span, and contractors Glen Wiley and G. W. Maxon confront logistical problems such as transporting materials to a work site one half mile out in the middle of the river. Long achieved a sound structure that is also aesthetically pleasing. Though forty-eight arch spans is a large number, the spandrel arcade and pier tops create a pleasing rhythm. This bridge is an ornament to the crossing as much as a practical structure, making it worthy of its dedication in memory of the veterans of Lancaster and York counties.

---

[37] Wolf, *Dedication Program*, 34.

[38] Wrightsville-Columbia bridges file, York County Historical Society.

[39] Wolf, *Dedication Program*, 34.

The cooperative effort between Lancaster and York county commissioners to erect a toll bridge is a rare example of how local governments build bridges. This project came on the eve of the Pennsylvania Department of Highways' state-level control of bridge building and road construction. That two county governments financed a construction project so large is amazing. While facing the pressures brought on by a developing national highway system, Lancaster and York counties creatively solved their traffic problems without the assistance of the fully developed highway construction system in place today.

SOURCES CONSULTED

American Society of Civil Engineers, Central Pennsylvania Section. "Columbia-Wrightsville Bridge," Lancaster County, Pennsylvania. National Historic Civil Engineering Landmark Nomination Form, 1984. American Society of Civil Engineers, Reston, Virginia.

"An Act granting the consent of Congress to the counties of Lancaster and York, in the State of Pennsylvania, to jointly construct a bridge across the Susquehanna River between the borough of Wrightsville, in York County, Pennsylvania, and the borough of Columbia, in Lancaster County, Pennsylvania." *U.S. Statutes at Large,* 1926.

"An Act to extend the times for commencing and completing the construction of a bridge across the Susquehanna River between the borough of Wrightsville, in York County, Pennsylvania, and the borough of Columbia, in Lancaster County, Pennsylvania." *U.S. Statutes at Large,* 1928.

Butko, Brian A. *Pennsylvania Traveler's Guide: The Lincoln Highway.* Mechanicsburg, Pennsylvania: Stackpole Books, 1996.

Condit, Carl W. *American Building Art: The Nineteenth Century.* New York: Oxford University Press, 1960.

_____. *American Building Art: The Twentieth Century.* New York: Oxford University Press, 1960.

Goodell, Robert H. "The Second Columbia-Wrightsville Bridge." *Papers of the Lancaster County Historical Society* 57 (1953): 1-22.

"Huge Steel Arch Center Moved as Units in Rapid Construction of 18 Span Intercounty Concrete Highway Bridge Across the Susquehanna River." *Construction Methods* (January 1930): 54-59.

Jackson, Donald C. *Great American Bridges and Dams.* New York: John Wiley and Sons, 1988.

Klein, Philip S., and Ari Hoogenboom. *A History of Pennsylvania.* 2nd ed. University Park: Pennsylvania State University Press, 1980.

Lancaster County, Pennsylvania. *Bridge Minutes,* 1874-1934. Lancaster County Courthouse, Lancaster, Pennsylvania.

_____. *County Commissioners' Minutes,* 2 January 1926 to 31 December 1929. Lancaster County Courthouse, Lancaster, Pennsylvania.

Mayo, Robert C. "The Fifth Columbia-Wrightsville Bridge." *Journal of the Lancaster County Historical Society* 73 (1969): 26-33.

"Memorial Bridge is Fifth to Cross Susquehanna River at Columbia." *Lancaster New Era,* Columbia-Wrightsville Bridge Edition, 10 November 1930.

Morse, Rollin D., and Leslie D. Harrington. "Columbia Historic District," Lancaster County, Pennsylvania. National Register of Historic Places Registration Form, 1982. U.S. Department of the Interior, National Park Service, Washington, D.C.

Pennsylvania. Act No. 516. *Laws of Pennsylvania.* 1929.

_____. Act No. 332. *Laws of Pennsylvania.* 1923.

Pennsylvania Department of Transportation. Bridge inspection file, BMS No. 36-0462-0010-0000. PennDOT District 8-0, Harrisburg, Pennsylvania.

_____. "Environmental Evaluation Report, Columbia-Wrightsville Bridge, L.R. 128, Section B14, York and Lancaster Counties, Pennsylvania." PennDOT District 8-0, Harrisburg, Pennsylvania.

_____. *Historic Highway Bridges in Pennsylvania.* Harrisburg: Pennsylvania Department of Transportation, 1986.

Remy, Patricia A. "Old Columbia-Wrightsville Bridge," Lancaster County, Pennsylvania. Pennsylvania Historic Resource Survey Form, 1982. Pennsylvania Historical & Museum Commission, Harrisburg, Pennsylvania.

Ruler v. *York County. Pennsylvania Supreme Court Reporter* 290: 427-37.

Sunday News (York, Pennsylvania).

Wolf, George S. *Dedication Program and History: Lancaster-York Intercounty Bridge, Armistice Day 1930.* Lancaster: Conestoga Publishing Co., 1930. Wrightsville-Columbia bridges file, York County Historical Society, York, Pennsylvania.

Wrightsville-Columbia bridges file. York County Historical Society, York, Pennsylvania.

York County, Pennsylvania. *County Commissioners' Minutes.* York County Courthouse, York, Pennsylvania.

APPENDIX: Suggestions for Future Research

Some questions concerning the Columbia-Wrightsville Bridge arose during the research and writing of this report. Some of these questions, due to limitations in the scope of the Pennsylvania Historic Bridges Recording Project - I, remain unanswered. Scholars interested in this bridge are encouraged to pursue the following:

1. More information on James B. Long, his other bridge projects and engineering accomplishments, would enrich this history of what is probably his greatest achievement.

2. Though the partnership of Glen Wiley and G. W. Maxon was short lived, they may have jointly or individually produced projects that incorporated some of the innovative techniques that earned them attention during the construction of this bridge.

3. The construction of this bridge is documented in photographs in the dedication program and in the *Construction News* article that describe the use of steel arch centers. These photographs were not located during the research for this report but would be very useful to historians of construction processes.